

## OPTICAL CROSSBAR USING LASING SEMICONDUCTOR OPTICAL AMPLIFIERS

### ABSTRACT OF THE DISCLOSURE

An optical crossbar switch is described that minimizes the number of electrical components and optimizes the conversion between optical and electrical signals. Utilizing various characteristics of lasing semiconductor optical amplifiers, the optical crossbar switch provides optical components in place of traditionally used electrical components. For example, an optical buffer is described that delays an optical signal a sufficient amount of time for a path to be created for the optical signal through the optical crossbar. Additionally, a monitor/detector circuit utilizes a ballast laser signal emitted from a lasing SOA during amplification of an optical signal in order to convert optical routing information to an electrical equivalent. As a result of the multiple uses of lasing semiconductor optical amplifiers, the bandwidth of the described optical crossbar switch is greater than traditional optical crossbar switches currently in use.